



**WESTCHESTER COUNTY  
DEPARTMENT OF ENVIRONMENTAL FACILITIES**

**CAPACITY, MANAGEMENT, OPERATION AND  
MAINTENANCE PROGRAM FOR SANITARY SEWERS**

**NOVEMBER 2016**

**UPDATED: NOVEMBER 2018**



# **Westchester County Sewer System Maintenance Plan November, 2018**

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# **1. COLLECTION SYSTEM MANAGEMENT**

## **a. Goals**

The Westchester County Department of Environmental Facilities (WCDEF) preventive maintenance plan (PMP) covers the assets that the County manages in our wastewater collection system and is one component of our overall Capacity, Management, Operations and Maintenance (CMOM) Plan. The PMP combines preventive, predictive and corrective maintenance strategies with best management practices. The CMOM Plan and PMP have been prepared to help WCDEF effectively manage our wastewater collection system and achieve the following goals:

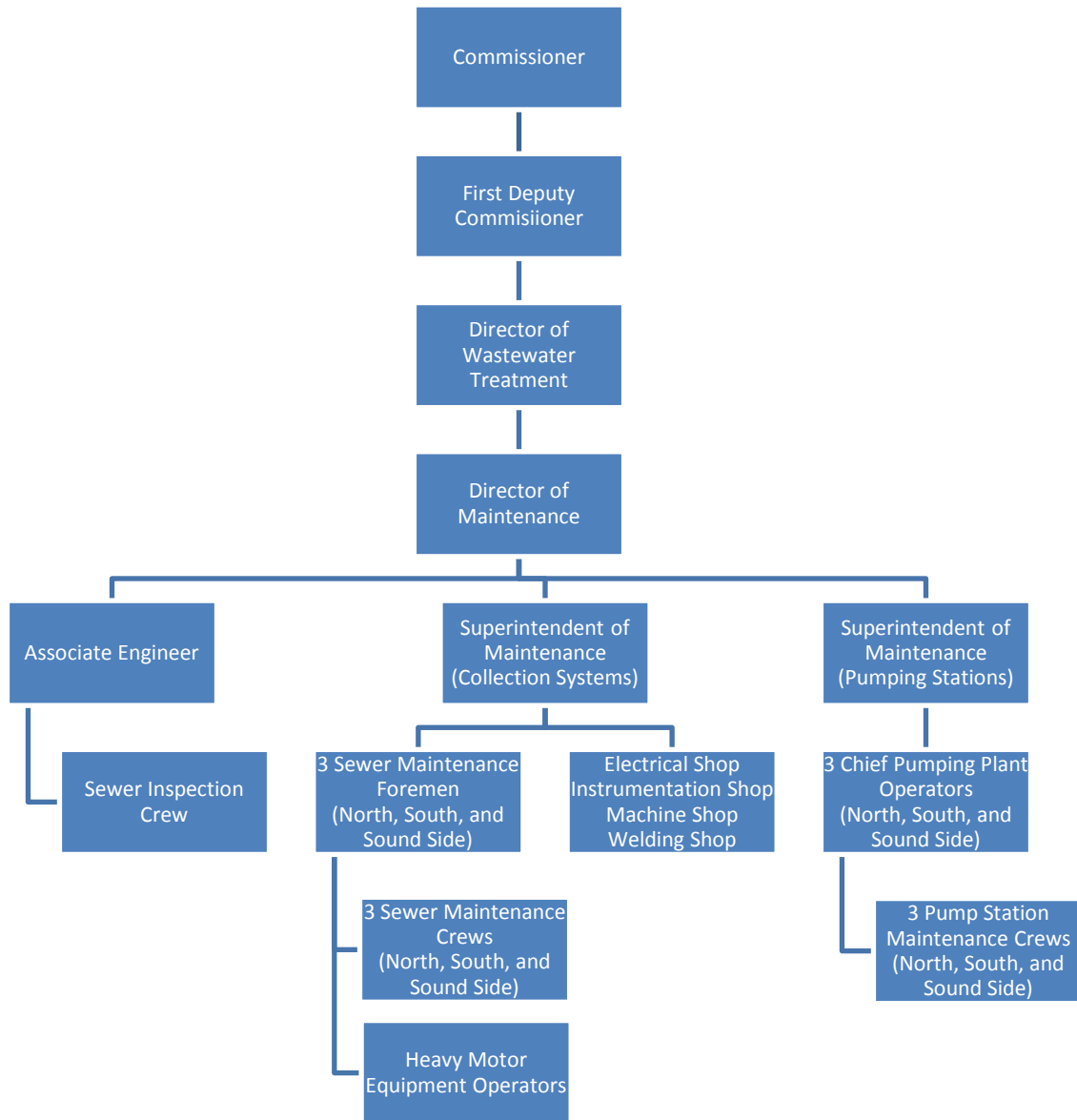
### **Goals**

- Prevent public health hazards
- Protect the environment
- Comply with regulations
- Minimize the frequency of Sanitary Sewer Overflows (SSOs)
- Mitigate the impact of SSOs
- Minimize disruptions in service
- Minimize complaints
- Provide quick response to any disruption in service that occurs
- Protect WCDEF's large investment in the sewer collection system by maintaining maximum capacity and extending the useful life of the associated assets
- Prevent unnecessary damage to public/private property
- Efficiently use the funds available for the maintenance of the infrastructure and the operation of services
- Reduce expenditures for emergency maintenance
- Convey wastewater to the Water Resource Recovery Facility (WRRF) with a minimum of infiltration, inflow and exfiltration
- Provide adequate capacity to convey peak flow
- Provide immediate, responsive, and efficient service to all emergency calls
- Provide a safe work environment for employees and residents in Westchester County
- Perform all operations in a safe manner to prevent personal injury
- Utilize evolving technology to increase our effectiveness and efficiency
- Provide reliable service now and into the future

## **b. Organization**

The Westchester County Department of Environmental Facilities is an independent department responsible for all aspects of wastewater collection and treatment. The Maintenance Division is responsible for the operation and maintenance of the collection system with a staff of 70 full-time operation, maintenance, engineering, and technician positions. Contractors are used for maintenance activities and emergency support when work exceeds the capabilities of the WCDEF staff. Figure 1 shows the organizational structure of the WCDEF.

Figure 1- WCDEF Division of Maintenance Organizational Chart



The names and contact information for key supervisory personnel are listed in Appendix A-1.

Commissioner – Establishes policy, plans strategy, leads staff, delegates responsibility, allocates resources, authorizes outside contractors to perform services. The Commissioner is required to have a Professional Engineer's License.

Director of Maintenance – Oversees the operations and maintenance of the sanitary sewer collection system, pumping stations, and combined sewer regulators. Prepares wastewater collection system planning documents, manages capital improvement delivery system, documents new and rehabilitated assets, and coordinates development and implementation of CMOM Plan. The Director of Maintenance is required to have a Professional Engineer's License.

Superintendent of Maintenance (Collection Systems) –Manages field operations and maintenance activities for collection systems and technical support groups, provides relevant information to agency management, prepares and implements contingency plans, leads emergency response, investigates and reports SSOs, and trains field crews.

Superintendent of Maintenance (Pumping Stations) –Manages operations and maintenance activities for the WCDEF's Wastewater Pumping Stations and Overflow Retention Facilities, provides relevant information to agency management, prepares and implements contingency plans, leads emergency response, investigates and reports alarm conditions, and trains field crews.

Sewer Inspection Crew – Perform manhole inspections over a 20-year cycle, and provide reports to the Associate Engineer. Review Dig Safely NY utility markout requests for possible impacts to WCDEF sewers. The WCDEF has 2 inspectors.

Sewer Maintenance Crews – Conduct operations and maintenance activities, including video inspection of sewer lines, mobilize and respond to notification of stoppages and SSOs (e.g., mobilize sewer cleaning equipment, by-pass pumping equipment, and portable generators). The WCDEF has 3 crews covering the North County, South County, and the Long Island Sound Side.

Pump Station Maintenance Crews – Conduct operations and maintenance activities at the pumping stations, including daily rounds, and responding to alarm conditions. The WCDEF has 3 crews covering the North County, South County, and the Long Island Sound Side.

Administrative Staff – Provide support for all of WCDEF's activities such as payroll, budget, purchasing, billing, personnel, in-house contract work, and other support functions as needed.

## **Relation to Other Municipal Functions**

The WCDEF is not a separate Utility or Authority, but rather a stand-alone Department within the County of Westchester. It is solely responsible for management, operations and maintenance of the County's 13 Sanitary Sewer Districts, 4 Water Districts, and 1 Refuse Disposal District. No WCDEF personnel are utilized for the benefit of other Municipal functions. Many activities of the WCDEF sewer collection system are supported by the following Westchester County Departments:

- Collection system mapping is supported by The Department of Information Technology. This department also provides support and advice concerning the WCDEF's future technology needs and development, and is responsible for maintaining and updating the County's servers where data for the GIS mapping system, Electronic Operations and Maintenance Manual (O&M), and System Control and Data Acquisition (SCADA) are stored.
- Resources and budget are overseen by The Department of Budget.
- Inspection of grease separators is performed by The Department of Health.
- Outreach for Fats, Oils and Grease is performed jointly by WCDEF and The Department of Health.
- Personnel administration is performed by The Department of Human Resources.
- Payroll and benefits are administered by The Department of Finance.
- Procurement of non-routine equipment, services or supplies is authorized by the Bureau of Purchase and Supply.
- The Department of Law provides legal services and advisory opinions to the WCDEF on departmental issues, contracts and agreements, and is responsible for handling all claims against the WCDEF and prosecuting violations of all Sewer Use Ordinances.
- The Office of Risk Management (a division of the Department of Law) ensures that all County Employees as well as outside consultants, contractors, and vendors are in compliance with applicable insurance and safety and health regulations.
- The Department of Public Works and Transportation holds consultant and construction contracts and provides administration for WCDEF Capital projects.
- The Westchester County Clerk maintains copies of Resolutions and County Ordinances passed by the Westchester County Board of Legislators related to the operation of the WCDEF.

### **c. Training/Safety**

The WCDEF continues to provide its employees with ongoing safety and operational training as a means to increase their overall knowledge and reduce employee injuries and illnesses. Our accident reduction efforts focus employees on safe behaviors and adherence to mandated safety procedures in compliance with state safety regulations. The components of the DEF Safety and Health Program include the following elements:

- Employee involvement and participation
- Management leadership
- Employee orientation and refresher safety training
- Accident and management review process
- Hazard identification and abatement

It is important to note that the WCDEF has been working through a series of significant infrastructure upgrades to its WRRF's and pumping stations which will improve the efficiency of the wastewater process and enhance safe working conditions in each location. Additionally, employees throughout our facilities are encouraged to identify potentially hazardous situations and report them to management for immediate abatement.

The WCDEF has also spent a significant amount of time and money training its employees. In addition to ongoing work site training, all new field employees are required to attend a 5 day safety orientation training program within their first year of employment. Thereafter for each subsequent year, all employees are required to attend annual refresher safety training which includes training on the following topics:

- HAZWOPER, how to properly respond to chemical spills in the workplace.
- Permit Required Confined Space Entry and Rescue Training.
- Personal Protective Equipment (PPE)
- Fire Prevention
- Basic Electrical Safety Lock Out/Tag Out equipment

Additionally, the WCDEF offers many specialized training programs including Forklift and Skid Steer training Hoist and Lift training, Adult CPR and Basic First Aid Training, and Driver Training. In total these safety training programs serve to maintain a high degree of safety awareness among all employees throughout the year.

The WCDEF also investigates every accident with each employee and discusses each one at its Accident Review Board meetings. The board reviews each accident to determine root causes and then makes recommendations to prevent recurrence.

The WCDEF is committed to provide every employee with the necessary knowledge and skills to safely perform their daily assignments. Our goal is to pro-actively create a work environment where safety is considered a required part of the business culture. Our ultimate goal is ZERO employee accidents and we continue to work towards that goal in partnership with our employees.

Training records are maintained for each employee in an electronic database. The WCDEF maintains appropriate safety equipment including: protective clothing, safety glasses, hard hats, gloves, respirators, filters, harnesses, tripods, hoists, fire extinguishers and self-contained breathing apparatus. The WCDEF also maintains and calibrates atmospheric testing equipment. Lights, barricades, signage and exhaust fans are also available at various WCDEF locations.

A summary of the current training programs are listed in Appendix A-2.

#### **d. Customer Service**

##### **1. Complaint Management Program**

Complaints and requests are received primarily by telephone and email. The WCDEF utilizes an Odor Complaint form (see Appendix B-1), and has developed a general form to document all

complaints and requests. These forms are entered electronically or handwritten and scanned. They are kept on file in the WCDEF's electronic Operations and Maintenance (O&M) Manual. The form includes the following information:

- Date and Time of complaint/request
- Receiver of complaint
- Complainant contact information
- Location of the problem
- Description of the complaint/request
- Crew sent to investigate
- Result of investigation
- Action taken to remedy the complaint
- Work Order number (if a WO is generated)

Once a complaint is received, WCDEF personnel perform an investigation, and personnel are sent to the location if necessary. If the problem cannot be resolved by WCDEF personnel, then our Emergency Contractor will be called in. If the WCDEF is not responsible for correcting the problem, the complainant will be provided with guidance on whom to contact, or a recommended course of action to take, as appropriate.

## **2. Public Information Program**

The WCDEF maintains a website at <http://environment.westchestergov.com/facilities>. This website contains a wealth of information about the various facilities and programs managed by the WCDEF.

### **e. Information Management and Geographic Information Systems**

The WCDEF uses Infor's Enterprise Asset Management System (EAM) software to manage information on our collection system such as routine and preventative maintenance. This system is linked to Westchester County's Geographic Information System (GIS). Table 1-1 shows the information that is included in our GIS of the collection system.

System information managed in our EAM, GIS, electronic databases and spreadsheets includes:

- Purchase orders
- Collection system mapping
- Collection system inventory
- SSO/Emergency response
- Department staff
- Safety incidents
- Training
- Job performance
- Routine and Priority Planned maintenance (cleaning, etc.)
- Inspection scheduling and tracking
- Work Orders
- Manhole Inspection Data
- Sewer Inspection Video

Activity performed by department personnel is generated and tracked through EAM. The EAM produces written work orders for the performance of routine and preventative maintenance as well as repairs and corrective actions in response to inspection findings or complaints. Upon completion of the task(s), data related to the work order is entered into the EAM for tracking performance and historical information on the Collection System. The EAM (along with the System Control and Data Acquisition system – See Section 6) serves as the WCDEF's information management system for the all of the collection systems operation and maintenance. Our EAM is operated through our Local Area Network (LAN). The system is backed up daily and access is restricted. Passwords are provided to WCDEF employees designated for access.

**Table 1-1: Collection System Map Information included in WCDEF's GIS**

<b>Manholes Map Information</b>	
- Unique ID number	- Cover Type
- Manhole Number/Name (from Aerial Maps)	- Engineer's Notes
- Aerial Map Grid Location	- Invert Elevation
- Municipality	- Rim Elevation
- Sewer District	- Drop Connection Elevation
- Barrel Material	- Depth
- Cover Size	- Manhole Inspection Data Sheet
<b>Sewer Line Map Information</b>	
- Unique ID number	- Size
- Line Name	- Diameter
- Section	- Length
- Contract Number	- Slope
- Year Built	- Upstream Manhole ID
- Type (Gravity/Force Main/Siphon)	- Downstream Manhole ID
- Material	- Sewer Inspection Video

## **f. Legal Authorities and Controls**

### **1. Sewer Use Ordinance**

Westchester County has established and implemented regulations regarding the use of the wastewater collection system. We have a comprehensive sewer use ordinance, which is a local law known as the “County Environmental Facilities Act”. As regulations and requirements have changed, Westchester County has passed additional local laws to address those issues. The County Environmental Facilities Act is included as Appendix B-2.

The items addressed through our sewer ordinance include: Use of County and Tributary Public Sewers; Discharge of Waters Not Containing Sewage; Materials and Substances Excluded from County and Public Sewers; Toxic Substances Prohibited or Accepted Conditionally; Materials and Substances to be Discharged into County and Public Sewers Only After Approval; Disposition of Scavenger Wastes; Terms and Conditions for the Issuance of Permits; Enforcement and Penalties; and the General Provisions which includes the power and authority of inspectors, and the User Charge Program.

### **2. Joint Sewer System Agreement**

Satellite communities are included in the Sanitary Sewer District (SSD) through County Legislation. By virtue of this legislation, agreements with the local municipalities are not needed.

## **g. Environmental Management System**

The WCDEF is certified as compliant with the ISO 14001:2015 Environmental Management System. The ISO 14001 standard requires that the WCDEF consider all environmental issues relevant to its operations, such as air pollution, water and sewage issues, waste management, soil contamination, climate change mitigation and adaptation, and resource use and efficiency. It also includes the need for continual improvement of its operations and approach to environmental concerns.

## **h. Inspections by Other Agencies**

In 2017, the United States Environmental Protection Agency (EPA) in a joint effort with the New York State Department of Environmental Conservation (DEC) conducted Sanitary Sewer System Compliance Evaluation Inspections (SSS-CEI) on 5 of the County’s 13 Sanitary Sewer Districts (SSD). The principal purpose of these inspections was to assess the system’s adequacy in minimizing the discharge of Sanitary Sewer Overflows (SSO’s). The WCDEF has addressed all issues and areas of concern identified during these inspections. A copy of the inspection findings, and the WCDEF follow up report is included in Appendix B-5.

It is anticipated that the remaining SSD’s will be inspected at a later date. However, it should be noted that the WCDEF does not own or operate any sanitary sewers in the Port Chester SSD.

## **2. GENERAL INFORMATION ABOUT THE WESTCHESTER COUNTY SANITARY SEWER SYSTEM**

### **a. Wastewater Treatment and Collection System Description**

The sanitary sewers in Westchester County are constructed, owned, and operated by the local municipality in which they serve. By the late 19<sup>th</sup> century, many of the locally owned and operated treatment plants had become obsolete or over capacity. In 1895 the Bronx Valley Sewer Commission was formed to address the severe pollution in the Bronx River, and construction of the Bronx Valley Trunk Sewer began in 1905. As pollution throughout Westchester County was becoming an increasing problem, the Westchester County Sanitary Sewer Commission was established in 1926 to develop a County-wide solution. A system of trunk sewers and sterilization plants was proposed, and the first wastewater treatment facility, The Blind Brook Project located in Rye, was completed in 1928. Other treatment facilities soon followed in Mamaroneck, South Yonkers, North Yonkers, as well as the major trunk sewers in what are now the Blind Brook, Mamaroneck, Bronx Valley, Central Yonkers, Hutchinson Valley, North Yonkers, Saw Mill Valley, South Yonkers, and the Upper Bronx Valley Sanitary Sewer districts. These trunk sewers are still in use today, and were designed to serve a population more than twice the current population of Westchester County.

The WCDEF currently owns and operates 196 miles of sewer, (ranging in size from 4” to 102” in diameter), over 3600 manholes, 42 Wastewater Pumping Stations, and 2 Overflow Retention Facilities. The WCDEF also operates a Septage Receiving Station where scavenger wastes collected from within Westchester County by private companies may be disposed of for a fee. This station is located in Hawthorne, NY, and the waste is conveyed to the Yonkers Joint WRRF through the County’s collection system.

The WCDEF staff and contractors perform planned maintenance tasks at scheduled frequencies. Frequencies are established based on experience and collection system information to minimize the risk of blockages or equipment failures that could lead to sewer overflows (see Cleaning, Inspection and Assessment, Section 3). Some portions of the wastewater collection system are maintained more frequently than others based upon past history and their importance to the effective operation of the wastewater collection system. Staff and/or contractors also perform unplanned maintenance (see Sewer Overflow Emergency Response Plan, Appendix A-3).

Westchester County is divided into thirteen Sanitary Sewer Districts (SSD’s) served by seven Water Resource Recovery Facilities (WRRF’s). Although planned to be included by the original Sanitary Sewer Commission, the north-eastern part of the County remains sparsely populated and is un-sewered. A summary is included in Table 2-1.

**Table 2-1: SSD's and WRRF's**

<b>DISTRICT</b>	<b>TREATMENT PLANT</b>	<b>RECEIVING WATERBODY</b>
Blind Brook SSD	Blind Brook WRRF 141 Oakland Beach Ave Rye, NY 10580	Long Island Sound
Mamaroneck SSD	Mamaroneck WRRF 199 W. Boston Post Rd Mamaroneck, NY 10543	Long Island Sound
New Rochelle SSD	New Rochelle WRRF 1 LeFevre Ln New Rochelle, NY 10801	Long Island Sound
Ossining SSD	Ossining WRRF 75 Westerly Rd Ossining, NY 10562	Hudson River
Peekskill SSD	Peekskill WRRF 700 Highland Ave Peekskill, NY 10566	Hudson River
Port Chester SSD	Port Chester WRRF 73 Fox Island Rd Port Chester, NY 10573	Long Island Sound
Bronx Valley SSD	Yonkers Joint WRRF 1 Fernbrook St. Yonkers, NY 10705	Hudson River
Central Yonkers SSD		
Hutchinson Valley SSD		
North Yonkers SSD		
Saw Mill Valley SSD		
South Yonkers SSD		
Upper Bronx Valley SSD		

## **b. Collection System Details**

### **Blind Brook SSD**

- Service Area: 14 Square miles
- Municipalities Served: City of Rye; Towns of Rye, and North Castle;  
Town/Village of Harrison; Westchester County Airport;  
State University at Purchase.
- Population Served: 25,855
- Miles of Gravity Sewer: 16.2
- Miles of Force Main: 5.4 (Includes 4.5 miles of the Blind Brook to Port Chester Sludge line)
- Number of Manholes: 400
- Number of Pump Stations: 1
- Number of Air Release Valves: 10
- Number of Siphons: 0
- Average System Flow: 3.0 MGD
- Peak Wet Weather Flow: 10.0 MGD
- WRRF Design Flow: 5.0 MGD
- WRRF Hydraulic Capacity: 15.0 MGD
- Age of System: 1926-1950: 7.3%  
1951-1975: 87.9%  
1976-present: 4.8%
- WRRF Construction: 1928 – Original Screen Plant  
1962 – Primary Treatment  
1985 – Secondary Treatment  
2010 – Biological Nutrient Removal

### **Mamaroneck SSD**

- Service Area: 30 Square miles
- Municipalities Served: Cities of New Rochelle, Rye, and White Plains; Towns of,  
Mamaroneck, North Castle, and Rye; Villages of Larchmont and  
Mamaroneck; Town/Village of Harrison and Scarsdale.
- Population Served: 89,423
- Miles of Gravity Sewer: 29.3
- Miles of Force Main: 2.3
- Number of Manholes: 732
- Number of Pump Stations: 8
- Number of Air Release Valves: 25
- Number of Siphons: 0
- Average System Flow: 14.6 MGD
- Peak Wet Weather Flow: 39.4 MGD
- WRRF Design Flow: 23.2 MGD
- WRRF Hydraulic Capacity: 90.0 MGD
- Age of System: 1926-1950: 86.1%  
1951-1975: 9.6%  
1976-present: 4.3%
- WRRF Construction: 1929 – Original Screen Plant  
1965 – Primary Treatment  
1989 – Secondary Treatment  
2014 – Biological Nutrient removal

### **New Rochelle SSD**

- Service Area: 9 Square miles
- Municipalities Served: City of New Rochelle; Town of Mamaroneck; Villages of Larchmont and Pelham Manor.
- Population Served: 75,072
- Miles of Gravity Sewer: 5.9
- Miles of Force Main: 3.7
- Number of Manholes: 147
- Number of Pump Stations: 9
- Number of Air Release Valves: 4
- Number of Siphons: 2
- Average System Flow: 14.0 MGD
- Peak Wet Weather Flow: 32.2 MGD
- WRRF Design Flow: 20.6 MGD
- WRRF Hydraulic Capacity: 54.0 MGD
- Age of System: 1926-1950: 0%  
1951-1975: 85%  
1976-present: 15%
- WRRF Construction: 1956 – Original Primary Treatment Plant  
1982 – Secondary Treatment  
2014 – Biological Nutrient Removal

### **Ossining SSD**

- Service Area: 13 Square miles
- Municipalities Served: Towns of Mount Pleasant and Ossining; Villages of Briarcliff Manor, Croton-on-Hudson, and Ossining.
- Population Served: 39,415
- Miles of Gravity Sewer: 5.0
- Miles of Force Main: 3.6
- Number of Manholes: 156
- Number of Pump Stations: 10
- Number of Air Release Valves: 7
- Number of Siphons: 1 (Will be reconstructed to eliminate the siphon by 2018)
- Average System Flow: 4.5 MGD
- Peak Wet Weather Flow: 8.1 MGD
- WRRF Design Flow: 7.0 MGD
- WRRF Hydraulic Capacity: 26.0 MGD
- Age of System: 1926-1950: 0%  
1951-1975: 0%  
1976-present: 100%
- WRRF Construction: 1981 – Original Secondary Treatment Plant

**Peekskill SSD**

- Service Area: 16 Square miles
- Municipalities Served: City of Peekskill; Towns of Cortlandt, Somers and Yorktown.
- Population Served: 41,349
- Miles of Gravity Sewer: 11.3
- Miles of Force Main: 3.7
- Number of Manholes: 272
- Number of Pump Stations: 2
- Number of Air Release Valves: 4
- Number of Siphons: 0
- Average System Flow: 6.7 MGD
- Peak Wet Weather Flow: 10.1 MGD
- WRRF Design Flow: 10.0 MGD
- WRRF Hydraulic Capacity: 22.5 MGD
- Age of System: 1926-1950: 0%  
1951-1975: 30%  
1976-present: 70%
- WRRF Construction: 1953 – Original Primary Treatment Plant (Constructed by the City of Peekskill)  
1980 – Secondary Treatment

**Port Chester SSD**

- Service Area: 2.5 Square miles
- Municipalities Served: Town of Rye; Village of Port Chester
- Population Served: 30,116
- Miles of Gravity Sewer: 0 (Collection system is owned and operated by the local municipalities in this district)
- Miles of Force Main: 1.0 (Part of the Blind Brook to Port Chester Sludge line)
- Number of Manholes: 0
- Number of Pump Stations: 0
- Number of Air Release Valves: 0
- Number of Siphons: 0
- Average System Flow: 4.4 MGD
- Peak Wet Weather Flow: 8.4 MGD
- WRRF Design Flow: 6.0 MGD
- WRRF Hydraulic Capacity: 13.4 MGD
- Age of System: 1926-1950: 0%  
1951-1975: 0%  
1976-present: 100%
- WRRF Construction: Original Primary Treatment Plant was constructed by the Village of Port Chester. Date unknown.  
1989 – Original Secondary Treatment Plant  
2017 – Secondary System Upgrade (RBC replacement)

**Bronx Valley SSD**  
**Central Yonkers SSD**  
**Hutchinson Valley SSD**  
**North Yonkers SSD**  
**Saw Mill Valley SSD**  
**South Yonkers SSD**  
**Upper Bronx Valley SSD**

\*These 7 SSD's are collectively called the "Yonkers Joint Sanitary Sewer Districts", and are served by the Yonkers Joint WRRF.

#### **Yonkers Joint SSD's**

- Service Area: 108 Square miles
- Municipalities Served: Cities of Mount Vernon, New Rochelle, White Plains, and Yonkers; Towns of Bedford, Greenburgh, Mount Pleasant, Mount Kisco, New Castle, North Castle; Villages of Ardsley, Briarcliff Manor, Bronxville, Dobbs Ferry, Elmsford, Hastings, Irvington, Pleasantville, Scarsdale, Sleepy Hollow, Tarrytown, and Tuckahoe.
- Population Served: 509,921
- Miles of Gravity Sewer: 88.5
- Miles of Force Main: 11.5
- Number of Manholes: 1,937
- Number of Pump Stations: 12
- Number of Air Release Valves: 27
- Number of Siphons: 2
- Average System Flow: 80.2 MGD
- Peak Wet Weather Flow: 150 MGD
- WRRF Design Flow: 120 MGD
- WRRF Hydraulic Capacity: 330 MGD
- Age of System:
  - 1900-1925: 14.5%
  - 1926-1950: 53.0%
  - 1951-1975: 31.0%
  - 1976-present: 1.5%
- WRRF Construction:
  - 1930 – Original Screen Plant
  - 1960 – Primary Treatment
  - 1978 – Secondary Treatment

#### **e. Sanitary Sewer Overflow History**

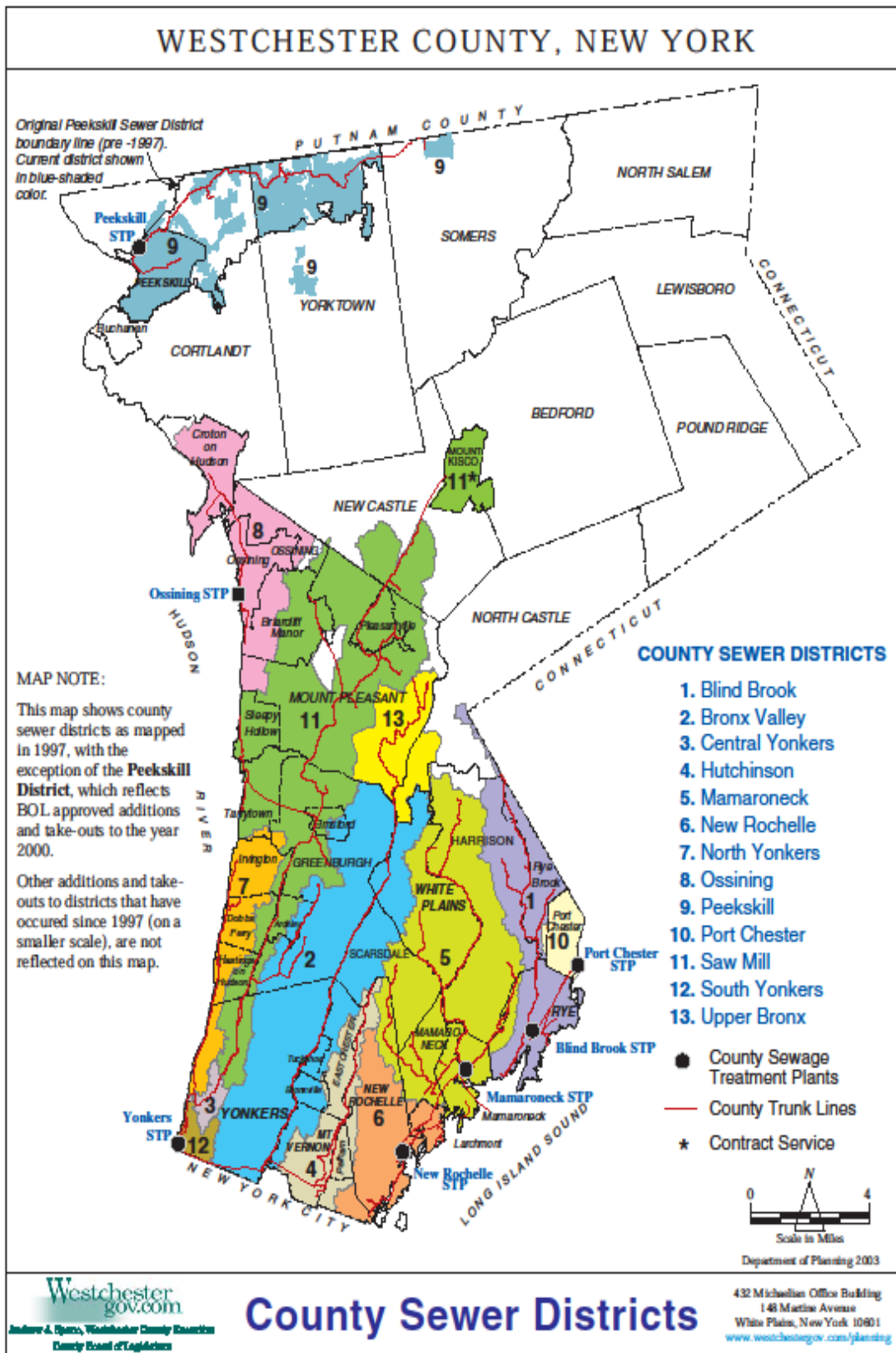
A summary of past overflows, as well as the Report of Non-Compliance Event, which is submitted to the New York State Department of Environmental Conservation, for any prior year overflows, is included in Appendix A-4.

To assure sewer capacity the WCDEF is developing programs to address capacity, inflow/infiltration, and condition of our collection system. These programs are described in Sections 3 and 9.

#### **f. System Map**

A general map of the system is shown in Figure 2. The map is updated by the County's GIS group as needed.

FIGURE 2: WESTCHESTER COUNTY SEWER SYSTEM MAP



### **3. CLEANING, INSPECTION AND ASSESSMENT PROGRAM**

The WCDEF has always had a program of annual manhole inspections. The Outside Maintenance crews would walk the lines, inspecting each manhole and assessing its condition, as well as checking for evidence of surcharging or overflows. Known problem areas were routinely cleaned to prevent the accumulation of grease and debris that could cause an overflow.

In 2004, prompted by the proposed CMOM regulations, the WCDEF began development of our formal preventive maintenance plan (PMP). This includes our Inspection, and Assessment program to assess the maintenance needs and structural condition of the entire collection system. The goal of this initial program was to complete the entire system assessment within 10 years. The program was divided into three phases of three years each. Approximately one-third of the sewers were to be assessed during each phase, with the tenth year as a cushion for lost time or delays.

The inspection and assessment program includes: CCTV inspection of piping, visual inspection and classification of the manhole structures and their flow channels, an evaluation of the condition of the pipes and manholes, and heavy cleaning as needed to allow the camera to pass. Results from the assessment program are used to prioritize repairs. These efforts have been performed by contractors, and comprehensive reports have been produced. While the data for previous inspections has not been entered into the EAM, all future inspections will be recorded in the EAM

Phase 1 was completed in 2007, and Phase 2 was completed in 2010. Phase 1 repairs are currently in design. From these investigations, a number of defects were identified, and the focus of the project shifted to the repairs and how to fund them, so the next phase was delayed. Phase 3 is currently in the investigation stage which includes cleaning and CCTV inspection.

#### **a. Cleaning**

Our primary sewer maintenance activity is sewer line cleaning. The cleaning of sewer lines, manholes, and other appurtenances is generally performed on an as-needed basis when a report of surcharging or overflow is made. Problem areas have been identified, and entered in the EAM for periodic preventative maintenance cleaning. Appendix A-7 lists these areas and the cleaning frequency.

The WCDEF is currently implementing a routine sewer cleaning program. The work will be done over a twenty-year cycle by WCDEF crews and contractors will work on the larger lines that our equipment cannot clean.

All cleaning records will be recorded on a log sheet in the field, and then entered into the EAM. The following information is recorded:

- Date, time and location of cleaning activity;
- Specific lines cleaned;
- Number of passes needed to clean the line;
- Presence of roots, grease, or debris;
- Problems identified or other follow up actions necessary;
- Date and time of post-cleaning video.

Each line segment cleaned is identified by a unique 4-digit number from our GIS system. These segment numbers are also available in our EAM, which enables integration between the EAM and the GIS systems.

Manhole deficiencies will also be noted in the cleaning logs (see Section b, below). Information about manholes requiring attention will be provided to the Director of Maintenance and either a repair work order is issued or it is added to the capital repair schedule.

A summary of the cleaning and inspection work performed in the prior year is included in Appendix A-8.

## **b. Manhole Inspection**

In 2009 the WCDEF established a two-person crew to perform Manhole Inspections. The goal is to inspect every manhole over a 20-year cycle.

Manhole inspections help keep our asset inventory up to date and are used not only to update collection system maps, but to determine structural condition. During manhole inspections, the field crew takes a complete inventory of each manhole including construction materials, ring size, depth to invert, flow conditions and evidence of problems according to the checklist in Appendix B-3. The WCDEF has developed an electronic version of this checklist utilizing the EAM. This is designed to be run primarily in the field on a tablet computer, but may also be run on a desktop computer to upload inspection data recorded on a hand written form. This system can automatically generate work orders to correct any deficiencies noted during the inspection.

Minor repairs are performed by the Outside Maintenance crew, while major repairs will be contracted out. Emergency repairs are immediately addressed by WCDEF crews or our Emergency Contractor.

## **c. Regulators and Tide Gates**

An area of 4 square miles in the west side of the City of Yonkers has combined sanitary and storm sewers. In this area there are 10 Combined Sewer Overflow (CSO) regulators which are designed to divert excess wet-weather flow to the Hudson River. Five of these regulators have tide gates which are designed to prevent the river from flowing back into the sanitary sewer system during periods of high tide. The regulators and tide gates are inspected at least once per week. The tide gates are also inspected after a heavy rain, as tides permit, to ensure the gate has closed properly.

## **d. Assessment**

While routine cleaning and visual inspection are used to assess the condition of manholes and surface facilities, CCTV video inspections are the primary method used to assess the condition of the sewer pipes. All records are currently submitted as a hard-copy report, with the videos on a DVD. The digital video is uploaded to the EAM and GIS systems.

Pipe condition information is used to determine short and long term maintenance strategies including increased cleaning, root treatment, sewer line repair, or replacement. The condition

assessment helps establish the cleaning frequency and inform the WCDEF's capital planning. As more condition assessment information becomes available, the priority of capital projects may change.

Condition assessments document the following details and deficiencies:

1. Characteristics including pipe diameter, and age and type of material
2. Dips in line
3. Grease build-up
4. Root intrusion
5. Sediment accumulation and encrustation
6. Structural condition, including cracks, corrosion and erosion
7. Joint alignment and movement
8. Reverse slope
9. Obstructions
10. Deformations in line

#### **e. Staffing and Equipment**

The WCDEF has 18 staff members trained for cleaning, inspection and assessment, and they are deployed in two or three person crews year round for cleaning. Manhole inspection work is coordinated with the Superintendent of Maintenance as needed for assistance with traffic control, difficult terrain, etc., with oversight from the Associate Engineer.

The following equipment is available for cleaning:

A Sewer Jet is used to clean most lines. The standard attachment used is a spinning head. Root saws are attached to the jetting equipment and used as needed. For heavy debris removal, the WCDEF will utilize a Vactor truck, which is a combination Sewer Jet and Vacuum. Jetting equipment is used to remove blockages from lines. The WCDEF also has an easement machine which can be utilized to clean lines that are difficult to access and/or too far away to reach with the jet equipment. Equipment inventory is covered more fully in Section 8.

## **4. GRAVITY LINE PREVENTIVE MAINTENANCE**

### **a. Fats, Oils and Grease (FOG)**

The Westchester County Department of Health (WCDOH) is tasked with the inspection of all Food Service Establishments (FSEs) in Westchester County. Information on FOG is included in the WCDOH's public outreach and education programs. In addition, the WCDEF sends an annual letter to all municipalities to remind them of their obligations to control FOG.

The WCDOH has enacted policy and procedure requiring all FSE's to install and maintain a grease interceptor or automatic grease removal device, and maintain records of maintenance and operation. The policy also includes annual inspections of FSEs that will be done by the WCDOH. If the grease interceptor has not been maintained (with documented removal of accumulated grease and cleaning), has been bypassed, or if significant grease is discovered within the service connection, the WCDOH will issue a letter to the owner giving notice of the ordinance/policy non-compliance and requiring action be taken to prevent further discharge of grease into the system. If the non-compliance is not remedied the WCDOH will take appropriate enforcement action.

Industrial grease producers are monitored and sampled by the WCDEF's Pretreatment Program. The WCDEF's sewer use ordinance prohibits discharges to the collection system containing more than 100 ppm of Oil and Grease, or at levels that interfere with the operation of the system. The ordinance also authorizes inspection of facilities during normal business hours.

Problem areas due to FOG are entered into the EAM for periodic preventative maintenance cleaning. These areas are listed in Appendix A-7: Collection System Trouble Spots. To date, the preventative maintenance cleaning as well as the public outreach programs have been effective in reducing blockages due to grease, and the WCDEF has not needed to implement a permit program or commence enforcement action against any FSEs. This periodic cleaning and inspection is evaluated see if the cleaning frequency can be reduced, or should be increased.

### **b. Root Control**

The WCDEF currently uses mechanical root removal for sewer lines with chronic root problems (see Appendix A-7: Collection System Trouble Spots). Root saw attachments are standard equipment on cleaning trucks. When a crew encounters roots during routine cleaning, a hydraulic saw is attached to the sewer jet and used to cut and remove the roots. The severity of the problem is recorded on the daily log, and if necessary, the pipe section is placed on the list for priority cleaning.

Cutting a tree's roots is like pruning the tree, and stimulates root growth into the system. Consequently, mechanical treatment must be repeated every year or two, which is factored into the cleaning schedules. The WCDEF has investigated a chemical root treatment program to control root growth, but has determined the current method of mechanical removal to be more efficient and cost effective.

### **c. Service Laterals**

The WCDEF does not own, operate, or maintain any service laterals in the collection system. All service laterals are the responsibility of the property owner, or the local municipality in which they are located.

The WCDEF has conducted a Flow Monitoring Program and Flow Reduction Strategy in its four wastewater sewer districts in the Long Island Sound watershed of the County. As part of those efforts, the condition of private laterals - identified as a significant contributor to inflow and infiltration - has been made part of WCDEF's negotiations of intermunicipal agreements (IMA) with municipal governments. Each local government that has signed an IMA with WCDEF has agreed to consider adopting a local law requiring that upon the transfer of title to any property connected to the sanitary waste collection system a licensed professional must certify the lateral has been video inspected and is free from visible defects.

## **5. EASEMENTS and PAVING: MAINTENANCE AND ACCESS**

### **a. Maintenance of Right of Way and Easements**

Easements give the WCDEF the right to install and maintain sewer and water facilities on private property not owned by the County. Sewer easements in Westchester County are typically 12 feet wide, but can be several hundred feet in length. These easements are recorded as deed records that are accessed through the Office of the Westchester County Clerk.

Construction and rehabilitation of sewers located within a public right-of-way is typically permitted with a letter agreement, or similar instrument. Access for routine maintenance and inspection of these manholes requires no special authority or permission, as they are within a public right-of-way.

Easements are important for our ability to operate and maintain our collection system. While some of the WCDEF's easements have a "no build-over" requirement, most easements were negotiated without this provision. Consequently, the WCDEF has lines that run underneath large commercial buildings.

When the easement has a "no build-over" requirement, the WCDEF is not liable to repair or replace any items that are removed in the process of completing repairs or maintenance on the collection system. Crews are, however, instructed to work with the property owner whenever possible. Manholes in easements are inspected as part of our ongoing preventive maintenance program.

As necessary, the WCDEF will issue a contract with a Certified Arborist to provide services for the assessment, maintenance, or removal of trees that may pose a threat to the safety and integrity of WCDEF personnel, sewers and facilities, as well as adjacent properties.

### **b. Street Paving Coordination**

The WCDEF does not permit the use of manhole extension rings. The agency responsible for road paving is advised that the manhole frame must be removed and raised to grade with block or brick. However, there are still extension rings that have been installed without the knowledge of the WCDEF. Upon discovery of a manhole extension ring, the WCDEF will work with the municipality or property owner to correct the problem. Fortunately, with the increased use of road milling prior to repaving, this is becoming less of an issue.

## **6. PUMP STATION/FORCE MAIN MAINTENANCE**

The WCDEF owns and operates 42 wastewater pumping stations and 2 Overflow Retention Facilities (ORF) which are summarized in Table 6-1. More detail is included in Appendix G: Annual Report of Sewage Pumping Station Operations

The performance of the WCDEF pumping stations is monitored through daily inspections and our Supervisory Control and Data Acquisition (SCADA) system. (Please see description below). During these inspections, the crew record pump run hours, removes screenings, and performs general maintenance and housekeeping as needed. Back-up generators are exercised monthly.

Inspection, maintenance and repairs are recorded on log sheets and then logged into the electronic Enterprise Asset Management system (EAM). If a problem or maintenance issue is encountered, personnel report it immediately to a supervisor for resolution. The EAM generates work orders for repairs, routine, and preventative maintenance. Repairs are a higher priority than routine and preventative maintenance.

The WCDEF has installed a SCADA system for all pumping stations. The SCADA remotely controls and monitors pumping station operations, and sends alarms to the North Yonkers Pumping Station, with a backup system at the Tarrytown Pumping Station, in the event of a malfunction or emergency. The SCADA system records all activities at a pumping station and provides continuous status of pumping station operations for the following items:

- Number of pumps in operation
- Status of pumps (including operational alarms)
- Current pumping flow rate
- Historic flow rate (24 hour Flow Chart)
- Pump start / stop cycles
- Power status (including power failure alarms)
- Wet well conditions (depth, lead / lag elevations, etc.)

Pumping stations with the remote monitoring capabilities of an installed and fully functioning SCADA can be evaluated to determine the need for daily physical inspections.

Manufacturer's Operation and Maintenance (O&M) manuals for equipment are located in the WCDEF's Electronic O&M manual.

Major pump rebuilding, motor rewinding and HVAC repairs for the pumping stations are contracted to outside vendors. Repairs to pumps, motor control centers, flow meters, valves, etc. are typically performed by WCDEF maintenance crews. Parts are typically obtained from local vendors or the manufacturer's service center, or are fabricated by the WCDEF's machine shop. As pumps and other parts are replaced, the WCDEF is making an effort to standardize pumping station equipment as much as possible. However, the diverse nature of the size and application, as well as product obsolescence makes standardization extremely difficult.

Whether repairs are made by local vendors or by WCDEF personnel, all repairs are recorded and tracked with the EAM.

**Table 6-1: Pumping Station Locations**

<b>FACILITY</b>	<b>Avg. Flow (MGD)</b>	<b>LOCATION</b>
<u>Blind Brook Sanitary Sewer District</u>		
Playland	0.5	At Playland Lake, in the City of Rye
<u>Bronx Valley Sanitary Sewer District</u>		
Sprain Lift	0.06	140' south of Jackson Ave in the median of the Sprain Brook Parkway in Town of Greenburgh
Jackson Avenue	0.4	At intersection of Sprain Road and Jackson Avenue, in the Town of Greenburgh
<u>Hutchinson Valley Sanitary Sewer District</u>		
Hutchinson	4.9	Garden Avenue Extension - City of Mount Vernon
<u>Mamaroneck Valley Sanitary Sewer District</u>		
Cove Road	0.04	Delancey Cove Road, 400'± west of Orienta Avenue in the Village of Mamaroneck
East Basin	0.3	South Barry Avenue at Guion Creek crossing in the Village of Mamaroneck
Edgewater Point	0.08	Flagler Drive, 1100'± west of Orienta Avenue in the Village of Mamaroneck
Fenimore Road	0.25	On west side of Fenimore Road, 200' north of Baldwin Place in the Town of Mamaroneck
Beaver Brook	0.01	Glen Oaks Drive and Beaver Brook in the City of Rye
Saxon Woods	0.03	In Saxon Woods Park in the Town of Mamaroneck
Weaver Street	0.35	On Central School Property, off Palmer Avenue in the Town of Mamaroneck
West Basin	1.2	On northeast corner of Boston Post Road and Orienta Avenue in Village of Mamaroneck
<u>New Rochelle Sanitary Sewer District</u>		
Beach Avenue	0.05	On Park Avenue 170'± east of Beach Avenue in the Village of Larchmont
Circle Avenue	0.03	In Manor Park, near intersection of Circle Ave and Park Ave in the Village of Larchmont
Fifth Avenue	0.6	Off Fifth Ave, in City Park in the City of New Rochelle
Flint Avenue	1.2	At intersection of Flint Avenue and Quarry Road in the Village of Larchmont
Glen Island - Admin	0.07	In Glen Island Park near the Administration Building
Glen Island - Casino	0.03	In Glen Island Park - Adjacent to the Casino
Magnolia Avenue	0.01	At intersection of Magnolia and Ocean Avenues in the Village of Larchmont
Sutton Manor	0.01	At intersection of Sutton Manor Road and Decatur Road in the City of New Rochelle
Woodbine Avenue	0.03	At intersection of Woodbine and Monroe Avenues in the village of Larchmont
Flint Park ORF	---	In Flint Park in the Village of Larchmont
Fort Slocum ORF	---	On Fort Slocum Road in the City of New Rochelle
<u>North Yonkers Sanitary Sewer District</u>		
Alexander Street	0.84	On west side of Alexander Street, 250'± north of Wells Avenue in the City of Yonkers
Dobbs Ferry	0.004	South of the Dobbs Ferry Metro North Train Station in the Village of Dobbs Ferry
Hastings	0.15	South end of River St in the Village of Hastings-on-Hudson
Irvington	0.85	On east side of South Buckhout Street, 400'± south of Main Street in the Village of Irvington
North Yonkers	28	On west side of Alexander Street, 200'± north of Wells Avenue in the City of Yonkers
<u>Ossining Sanitary Sewer District</u>		
Archville	0.005	East side of Route 9 just south of Requa St. in the Town of Mount Pleasant
Country Club Lane	0.001	Off Albany Post Road, end of Country Club Lane in the Town of Mount Pleasant
Croton	0.9	On Municipal Pl. between Route 9 and So. Riverside Ave in the Village of Croton-on-Hudson
Crotonville	1.5	On dead-end of Old Albany Post Road, in the Town of Ossining
Kemeys Cove	0.36	On Kemeys Avenue, 600'± south of Revolutionary Road in the Village of Ossining
Ballfield	0.0001	Croton Landfill - Croton Point Park
Condensate	0.0001	Croton Landfill - Croton Point Park
Seeps	0.002	Croton Landfill - Croton Point Park
Pump Station #1	0.007	Croton Landfill - Croton Point Park
Pump Station #2	0.05	Croton Landfill - Croton Point Park
<u>Peekskill Sanitary Sewer District</u>		
Mill Street	0.64	On east side of Mill Street, 2000'± north of Route 6 in the Town of Yorktown
Water Street	1.08	On east side of North Water Street, 400'± north of Central Avenue in the City of Peekskill
<u>Saw Mill Valley Sanitary Sewer District</u>		
Briarcliff	0.37	On east side of Route 9A, 3000'± north of Route 117 in the Town of Mount Pleasant
Tarrytown	3	1000'± south of Depot Plaza in the Village of Tarrytown
<u>South Yonkers Sanitary Sewer District</u>		
Ludlow Street	0.36	On west side of Federal Street, 400'± north of Ludlow Street bridge in the City of Yonkers
Main Street	0.7	On south side of Main Street and west of Metro North RR tracks in the City of Yonkers

## **a. Mechanical and Electrical Maintenance**

The size of the pumping station and its related equipment determine its specific mechanical and electrical maintenance needs. The routine maintenance of each pumping station has been incorporated into the EAM. As equipment is replaced or added, the Design Engineer uses manufacturers' Operation and Maintenance manuals to establish action items for pumping station equipment, and adds this information to the EAM.

The EAM generates work orders for all preventive maintenance actions. These work orders are left in an "open" format until maintenance crews enter completion comments pertaining to the work order. Any problems or maintenance issues noted by crews are reported to a supervisor for resolution.

All Wastewater Pumping Stations are checked daily by the Pump Station Maintenance Crews. These daily rounds typically include the following:

- Log and review pump run hours or totalized flow
- Check wet well levels and check for debris, turbulence or unusual noise
- Remove screenings
- Check alarms
- Ensure that all switches, controls and valves are in the correct position
- Pick up litter, general housekeeping
- Record findings in log book
- Ensure that all switches and controls are in the correct position
- Operate each pump
- Check bearings and packing
- Check for pump vibrations, unusual noise, and excessive heat
- Check valve operations and signs of leakage
- Lube and grease equipment as necessary (as required by manufacturer)
- Replace hydraulic fluids and oils (as required by manufacturer)
- Check chart recorder
- Check level controllers
- Check remote monitoring equipment
- Check indicator and alarm lamps
- Check general electrical items (lighting, etc.)
- Check and release intrusion alarm
- Inspect discharge piping
- Check for corrosion problems
- Exercise check valves
- Inspect HVAC equipment
- Check building security
- Remove grease build up (as necessary)
- Exercise emergency generator (once per month, the station is operated on generator power for one hour)

Electrical maintenance is performed annually on the following:

- All Control Panels
- Lighting is checked and serviced as needed
- Pumping Station Electric Heaters are serviced
- Outdoor SCADA Enclosures are serviced (Biannually)
- Batteries are checked and replaced as needed (UPS, generators, emergency lights, alarm boards, CO/smoke detectors, etc.)
- Major Switch Gear is serviced by an outside contractor
- Generators and Transfer Switches are serviced by an outside contractor

In addition to the foregoing, the grounds are checked weekly (except for the winter months) by the Outside Maintenance Crews, and maintenance such as grass cutting, hedge trimming, leaf and debris removal, etc. is performed as needed.

#### **b. Force Main Maintenance**

The WCDEF has 42 force mains in the collection system with a combined length of 31.2 miles, and a total number of 77 air release valves located at the high points in the force main. All air release valves and valve vaults are inspected periodically for signs of corrosion, connection point leakage, or improper operating characteristics. The electronic O&M manual contains the service procedures for the air release valve maintenance. These preventative maintenance procedures are included in Appendix B-4.

#### **c. Corrosion control**

The dissolved oxygen content of the wastewater is often depleted in the wet well of the pumping station. This wastewater passing through the force main not only lacks oxygen, but contains sulfides. These sulfides have led to corrosion in the gravity sewers immediately downstream of the force main, as well as producing strong odors. To combat this, the WCDEF has used sodium hypochlorite (NaOCl), which is an effective oxidizing agent, but is extremely hazardous. The WCDEF has recently switched to magnesium hydroxide ( $Mg[OH]_2$ ), which is non-toxic and safe. Initial evaluations indicate that the magnesium hydroxide is effective in reducing odor, and requires no special handling or storage. It is too early to tell if this chemical will be effective in inhibiting corrosion.

## **7. REACTIVE MAINTENANCE**

This chapter outlines the process used by the WCDEF to respond to non-overflow, unplanned maintenance needs in our collection system. It also provides an overview of responsibilities for emergency events. While Chapter 3 outlines preventive maintenance and Appendix A-3 details the response procedures for emergency sewer overflows, this chapter is written to address those unscheduled maintenance events that don't result in overflows or backups of sewage into basements.

Sewer Overflow Emergency Response is always a priority situation; details are provided in the WCDEF's Sewer Overflow Response Plan (SORP). This plan is included in Appendix A-3.

Responsibilities for reactive maintenance are assigned by the Superintendent or Chief Operator based on level of priority for response.

### **a. Corrective Maintenance**

Most repair needs are identified while conducting routine maintenance or daily rounds. Because there is such a wide range of potential unexpected events, it is not possible to prescribe the appropriate repair for every possible scenario. The Chief Operator will schedule and prioritize corrective maintenance repairs based on severity, and the potential to cause a sewer overflow or spill if not corrected.

Low-risk items, such as light bulbs or non-critical items, are planned for run-to-failure, and as such, are not part of the PM Program. These items are replaced when they fail. When assets critical to the process fail, they are scheduled for corrective maintenance either on an urgent or priority schedule. Most of these repairs are handled under the operations and maintenance budget, while others can wait for the capital improvement of the pumping station.

Corrective maintenance repairs include (but are not limited to):

- cleaning to eliminate flow problems that are noted during inspections
- replacing a rattling or failed manhole cover
- repairing or replacing a pump that is becoming clogged or has been damaged by debris
- responding to, investigating and mitigating customer complaints

### **b. Scheduling**

Scheduling of repairs runs the range from repairing components found to be in substandard condition during inspection, immediate repairs to pumping stations that are malfunctioning, to major repair projects, such as pipe rehabilitation/replacement or pumping station upgrades.

### **c. Tracking and Recording Repairs**

The pumping station maintenance crew documents corrective maintenance needs in the Log Book at the time of the event. Corrective maintenance tasks are recorded in the Log Book when completed and then input into our EAM. CCTV or other analysis may also be done by staff as a corrective maintenance task after a problem occurs, (such as when a manhole is found to be

surcharged, etc.) to diagnose the cause of the problem and recommend repairs and schedule changes if needed. Findings may lead to a spot repair of the pipe, root cutting, root foaming with an herbicide (by a contractor), re-cleaning for grease or debris removal on a periodic preventive basis, and if so, these tasks are included in an update of our schedule as described in Section 3, Cleaning, Inspection and Assessment.

#### **d. Complaint Response**

The Outside Maintenance Crew is responsible for responding to sewer service complaints. Complaints are generally related to sewer stoppages, overflows, or odors. Response is performed by the one of the three crews during work hours, based on the location of the complaint. During off work hours, personnel are called in as needed to respond.

Complaint response includes both assessing the complaint and resolving the problem. The majority of our complaints are related to sewer overflows, typically caused by blockages from grease or debris in the sewer.

The WCDEF is currently developing procedures to track these complaints and response activities in our Operations and Maintenance (O&M) Manual. Any response that requires corrective maintenance will be entered into the EAM.

## **8. EQUIPMENT AND TOOL INVENTORY**

### **a. Essential Day-to-Day Items**

The WCDEF provides operations and maintenance crews with the essential work related items they use on a day-to-day routine basis. Should new or replacement equipment or tools be needed, the crew leader notifies the Superintendent who requests a purchase requisition for the needed item(s).

### **b. Heavy Equipment**

The WCDEF owns and maintains a fleet of heavy equipment for use in routine operations as well as corrective and emergency repairs. A list of heavy equipment is included in Appendix A-6.

### **c. Spare Parts**

The WCDEF keeps a limited supply of spare parts in stock such as fuses, valves, filters, seals, motors, spare pumps, pump parts, etc. This inventory is primarily used for off-hour emergency repairs, or to quickly replace items that are not readily available, such as manhole frames and covers. The WCDEF also maintains an inventory of various sizes of pipe and repair clamps which can be quickly deployed to an emergency repair site.

## **9. CAPACITY MANAGEMENT**

### **a. Capacity Background**

To date, the WCDEF's collection system has not exceeded design capacity to contain wastewater flows from within Westchester County.

A large percentage of the WCDEF's sewers were designed and built in the late 1920's to early 1930's. At that time, the sewers were designed to accommodate a population of two million people in the year 2000. According to the 2010 Census, Westchester County had a population of 949,113, of which 811,151 live in one of the County Sanitary Sewer Districts, as estimated in 2016 by the Westchester County Department of Planning. As this is less than half of the design population of the sewers, the WCDEF has adequate capacity for many years to come.

### **b. Sewer Capacity Certification/Connection Policy**

The WCDEF regularly checks the capacity of its sewers as requests are submitted to add flow or to make a new connection. Depth of flow is also noted as part of our Manhole Inspection program, as well as before and after cleaning.

Sewer Capacity Certification is a process where any new development requiring the connection of its sanitary sewer service to the WCDEF sewer system is reviewed to determine whether adequate sewer system capacity exists to convey the new wastewater flow from the proposed development to our wastewater treatment facility. A capacity analysis by a WCDEF engineer is performed for all new connections to the Westchester County sanitary sewer system.

To obtain approval for the sewer connection, developers of newly-constructed homes and businesses are requested to remove an amount of infiltration/inflow (I/I) from the system equivalent to three times the proposed additional wastewater flow. If the project is for Fair and Affordable Housing, the Developer is requested to remove an amount of I/I equivalent to the proposed additional wastewater flow.

## **10. RESOURCES AND BUDGET**

The Collection system budget of the Department of Environmental Facilities Sewer District Division is accounted for in two distinct annual budgets. These Budgets are funded by an ad valorem tax.

The first is for operations and maintenance (O&M) expenses. These O&M expenses are consolidated into one fund and allocated out to the 13 individual Sewer Taxing Districts based on the fully equalized value (FEV) of each of those Districts. As the total FEV of the individual Districts changes as compared to the total FEV of all Districts, the percentage of the O&M expenses allocated to that District changes as well. A summary of the Collection System Operating and Maintenance Expenses is included in Appendix A-9.

The second is for Capital Expenses, including debt service and debt related expenses, which are allocated directly to the Taxing District(s) that benefits from these Expenses and generally in which the expenses are incurred. A summary of Current Open Capital Projects is included in Appendix A-10.

## **11. SEWER SYSTEM PREVENTIVE MAINTENANCE PLAN UPDATES**

### **a. Plan Update Process**

The WCDEF will complete annual reviews of this Plan and of our Preventive Maintenance program. The review will consider the progress that has been made in developing and implementing our Preventive Maintenance Program, the results of our monitoring program described in Section b., below, and will incorporate updates to this Plan including:

- Changes to organizational structure, information management, contacts, and system maps,
- Changes to information on the collection system, such as the size and age of pipes, to incorporate information on repairs completed during the year,
- Incorporation of successful cleaning, inspection and assessment program improvements during the past year,
- Changes to our Sewer Use Ordinance,
- Updates to our pumping station inspection and maintenance program,
- Budget and Capital Planning updates,

### **b. Monitoring, Measurement, and Program Modifications**

As noted in Chapter 1, the WCDEF maintains complaint and blockage records, records of cleaning and other preventive maintenance activities. Any problems (e.g., excessive debris, observed manhole defects) identified through regular sewer maintenance activities are recorded in the EAM.

This information is continuously reviewed to identify “hot spots”, or areas that may need to be added to the EAM for periodic cleaning, or scheduled for rehabilitation.

The sewers that are owned and operated by the WCDEF are well designed, and generally have sufficient capacity to contain surcharges due to minor debris or grease accumulation. The Cleaning, Inspection and Assessment Program as described in Chapter 3 will reduce sanitary sewer surcharges and ensure continued capacity for years to come.